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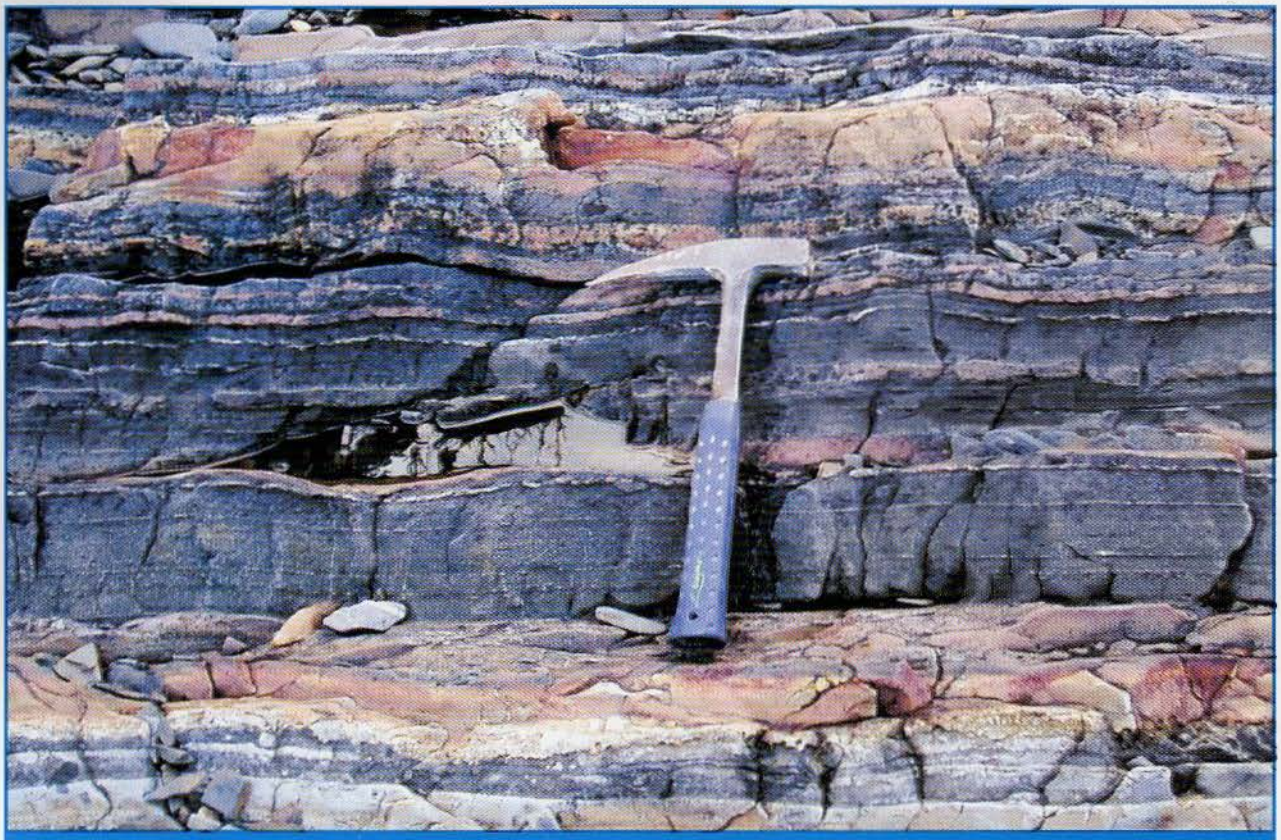

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Una contribución a :

Año Internacional del Planeta Tierra

Año Polar Internacional

Famatinian cordierite-bearing magmatism on the proto-Andean margin of Gondwana

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Petrological and geochemical data from the Cerro Toro unit and Mazán granite, in Sierra de Famatina and Sierra de Mazán, respectively, as well as the Tuaní Granite in the Sierra de Chepes (Dahlquist *et al.*, 2005), indicate that the Famatinian peraluminous magmatism in the Sierras Pampeanas defines trends from intermediate (60.7-69.9%) to felsic (71.3-73.6%) compositions, with mineral associations formed by Pl, Mc, Qtz, Bt, Ms, Crd, ± Gtr and Zrn, Mon, fluor-Ap, Opq (mainly ilmenite and/or titanomagnetite). The granites show a distinctive high Aluminium Saturation Index (1.39-2.07), that increases towards the most mafic varieties defined by cordierite-bearing granitoids with high $FeO_t + MgO + TiO_2$ (5.7-11.3%) and intermediate $Na_2O + K_2O$ (5.2-6.7%) contents. All granitic suites define similar magmatic trends in the high peraluminous field of the A-B multicationic diagram, indicating that they crystallized in medium- to low- P conditions (A = 60-180 and B = 100-190), similar to those observed in other cordierite bearing S-type granites (*e.g.*, Cooma granodiorite in the Lachlan Fold Belt, SW Australia). Moreover, source discrimination diagrams show that the trends of the cordierite-bearing suites are projected in the greywacke field, with Rb/Ba = 0.16-0.56, Rb/Sr = 0.70-2.83 and CaO/Na_2O = 0.34-0.69. Euhedral crystals of magmatic cordierite [Mg/(Mg+Fe+Mn) = 0.59 ± 0.04; Na + K = 0.05 ± 0.01, n = 23], devoid of mineral inclusions, are typical of all these granites, accompanied by plagioclase (An = 29.7 ± 4.8, n = 23), alkali feldspar (Or = 84.9 ± 7.1, n = 6), biotite [Fe/(Fe+Mg) = 0.53 ± 0.06, n = 31] and garnet (Alm = 72.2 ± 1.3, Prp = 12.2 ± 1.6 and Spss = 12.2 ± 2.7, n = 10).

This peraluminous magmatism is the result of regional anatexis of a plagioclase-rich, immature continental platform sedimentary source, during a time-restricted episode (484-479 Ma, U/Pb SHRIMP, Pankhurst *et al.*, 2000), and with a high geothermal gradient.

References

Dahlquist J.A., Rapela C.W., Baldo E., 2005. Journal of South American Earth Science **20**, 231-251.

Pankhurst R., Rapela C., Fanning C., 2000. Transactions of the Royal Society of Edinburgh: Earth Sciences **91**, 151-168.